

CDTI

(Cockpit Display of Traffic Information)

Overview for DAG-TM



NASA Ames Research Center
Flight Deck Display Research Group

CDTI

Introduction

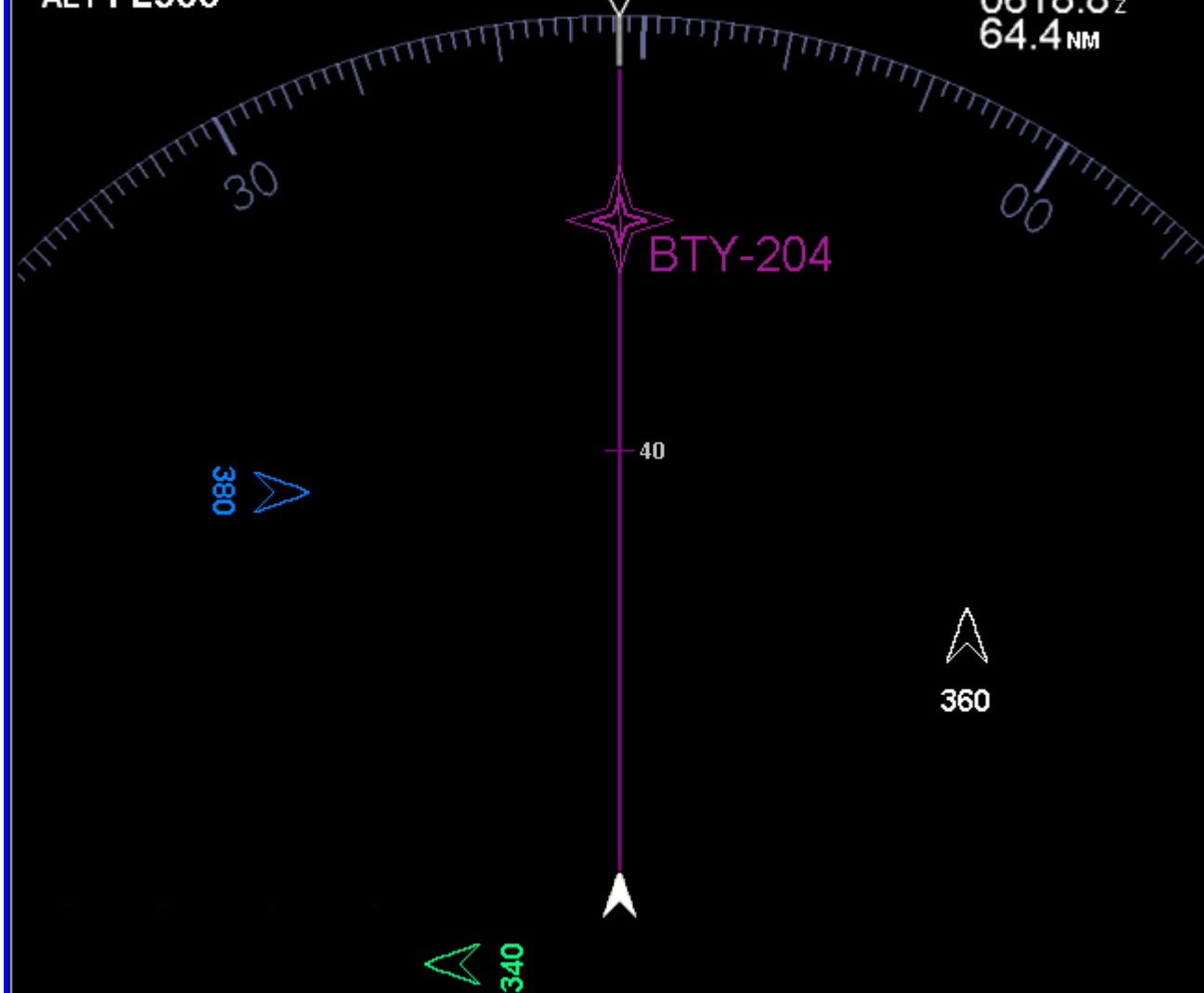
- » Displays proximal traffic, relative to ownship.
- » Unit capability can range from totally passive to richly function interactive.
- » Benefits include general traffic awareness, route planning, and optimization under free flight conditions, route modification for 'events,' conflict resolution, and automation monitoring.

- »  = Left Mouse Click
-  = Right Mouse Click
-  = Dwell
-  = Drag and Drop

GS 385 TAS 385
ALT FL360

TRK 328 MAG

BTY-204
0618.8_z
64.4 NM



RAT

SPC

Abs

IDs

S Tags

Rtes

Cpt

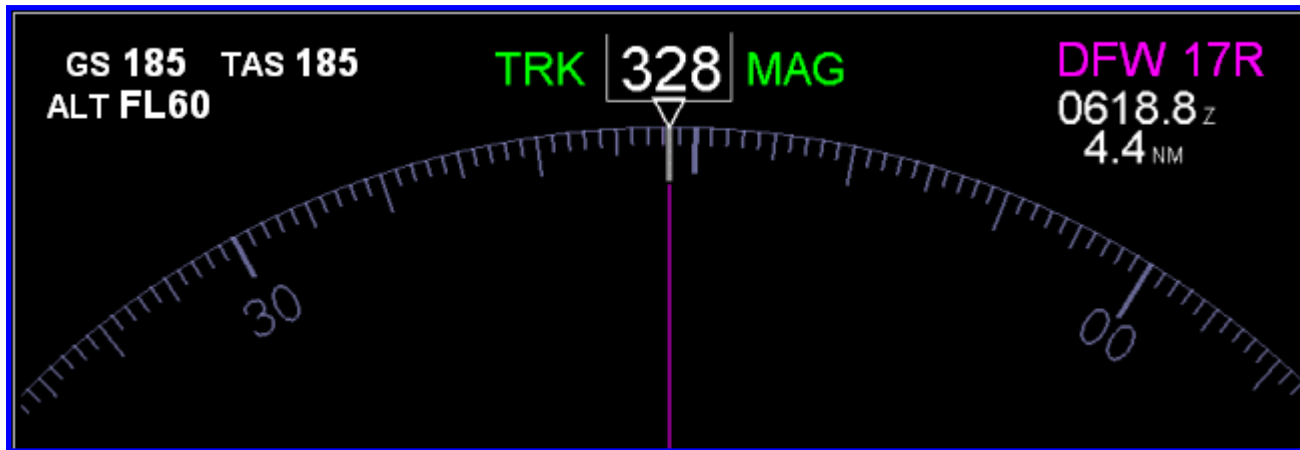
10:00

Pred

D-Link

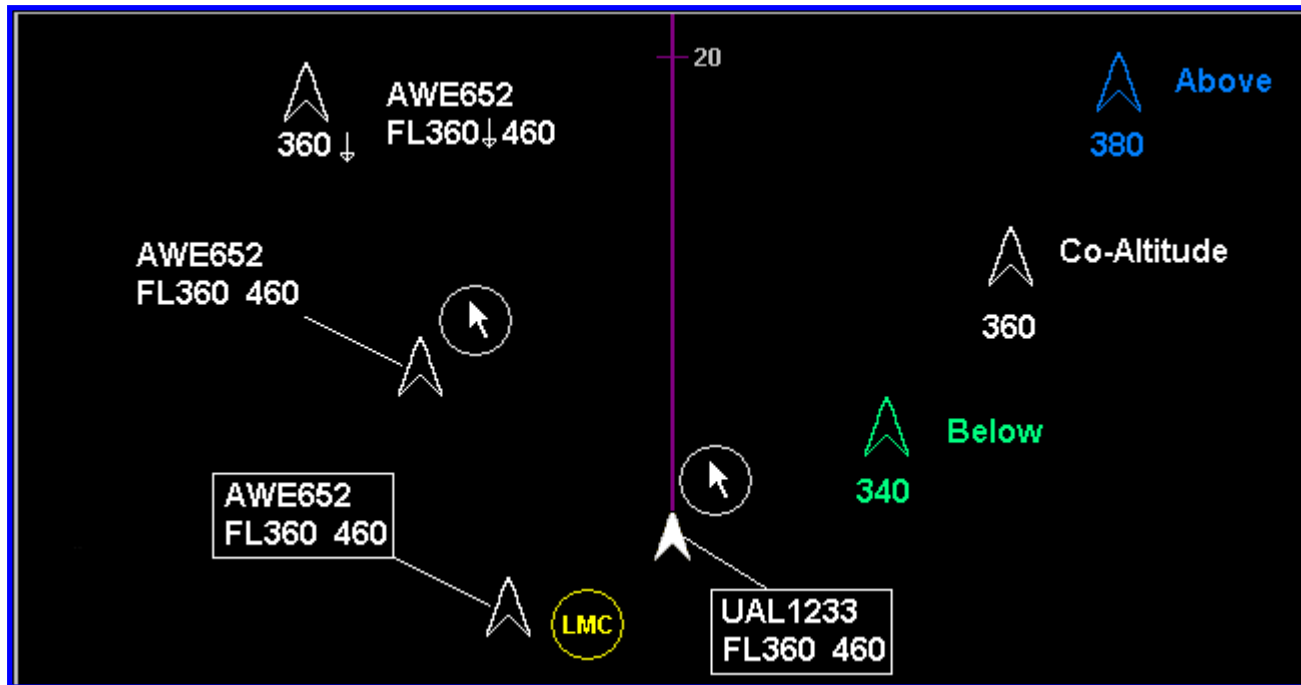
CDTI

Ownship Status



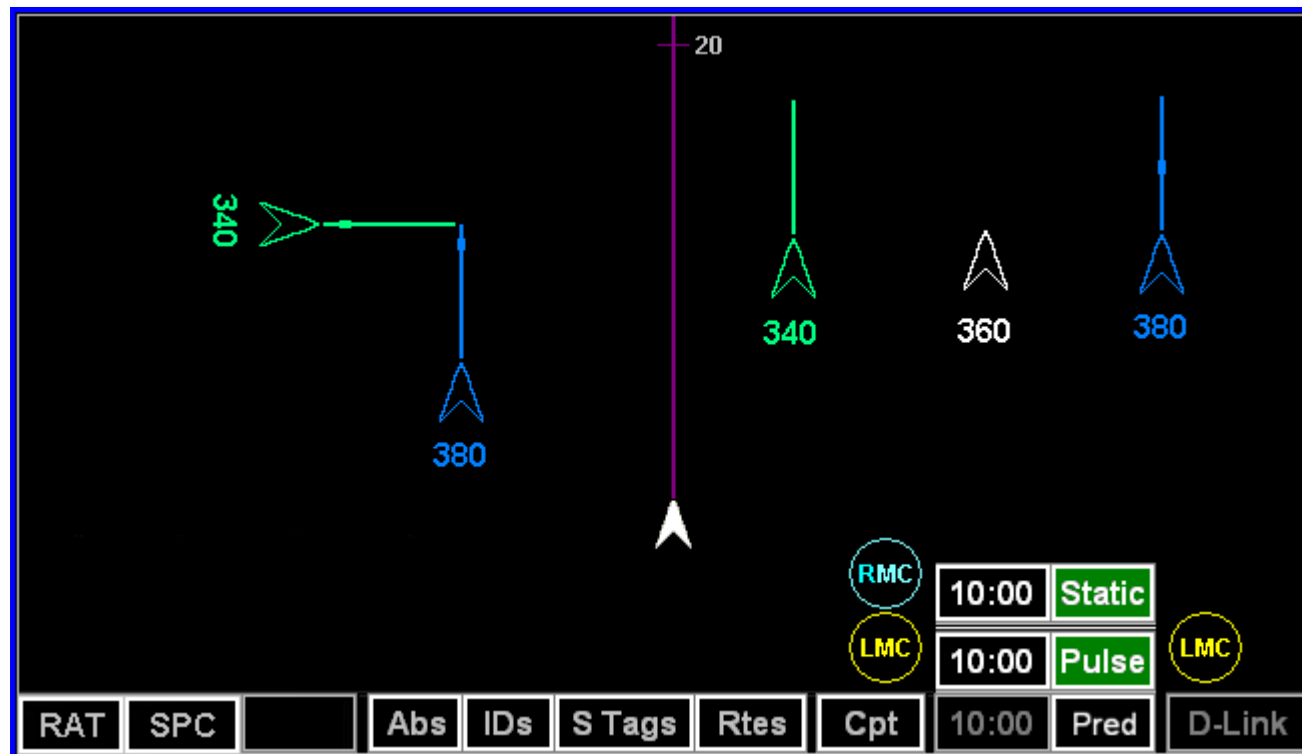
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Traffic Depiction



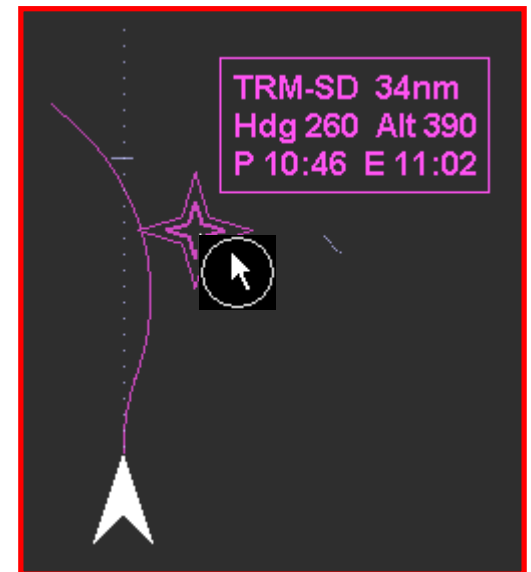
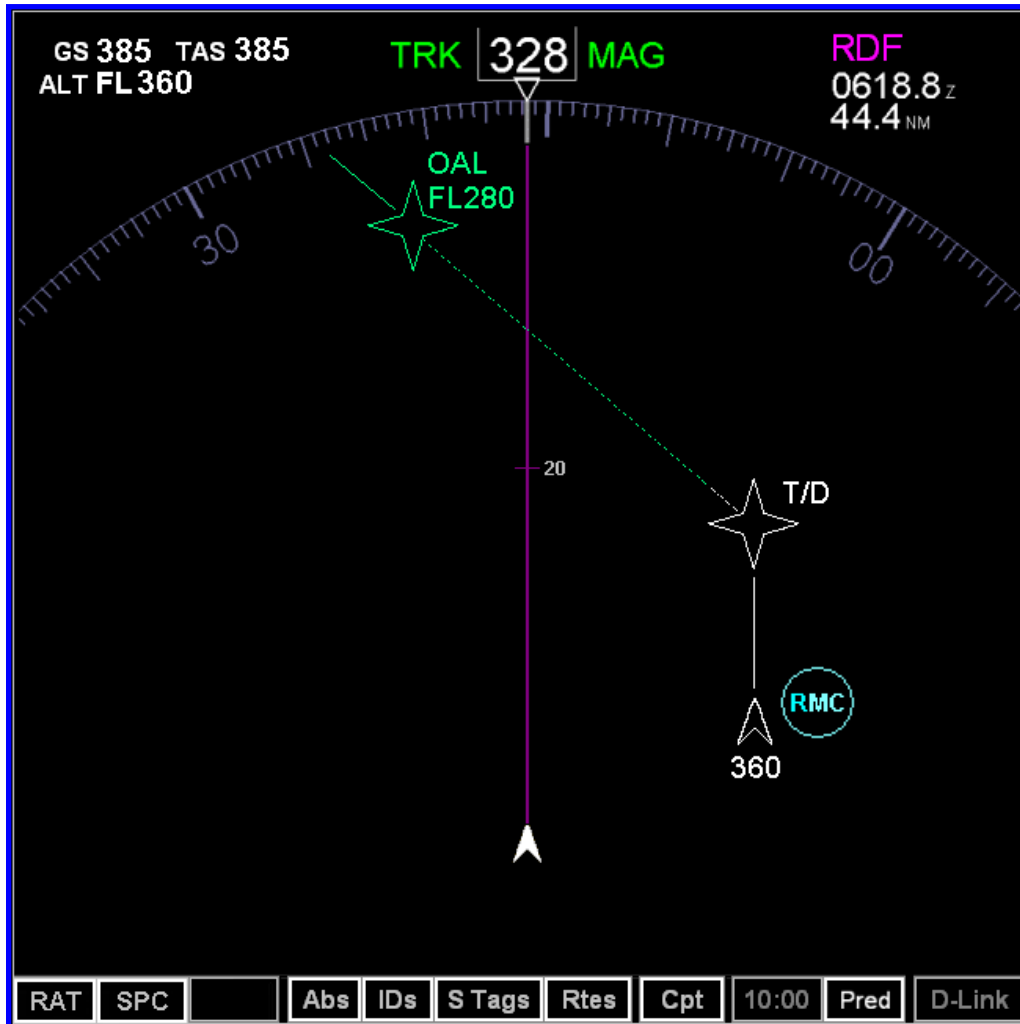
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Predictors



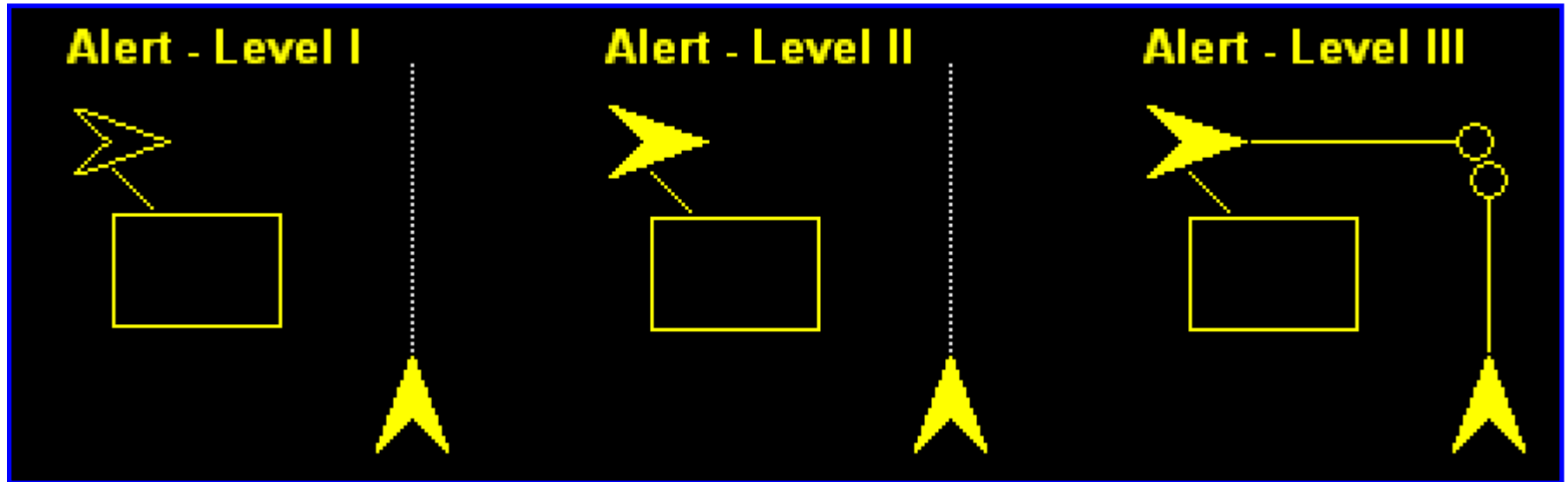
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Flight Plans



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Conflict Alerting



Alert Level I
“Potential”



Alert Level II
“Probable”

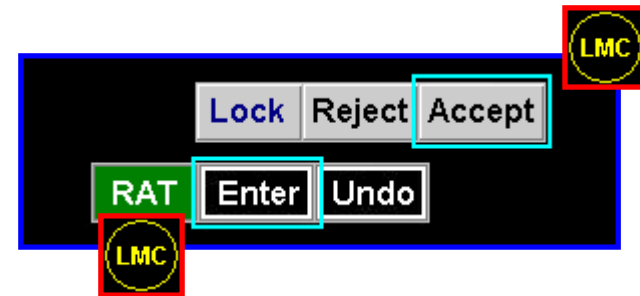
Alert Level III
“Certain”

ALERT
LOS 10:40

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Advanced – Route Assessment Tool (CE-5: Free Flight Airspace)

- » Loss of Separation Alert [**LOS 10:45**]
- » Engage Route Assessment Tool - RAT 
- » Modify ownship heading (speed, altitude) 
- » Enter >> Accept, to execute new flight plan

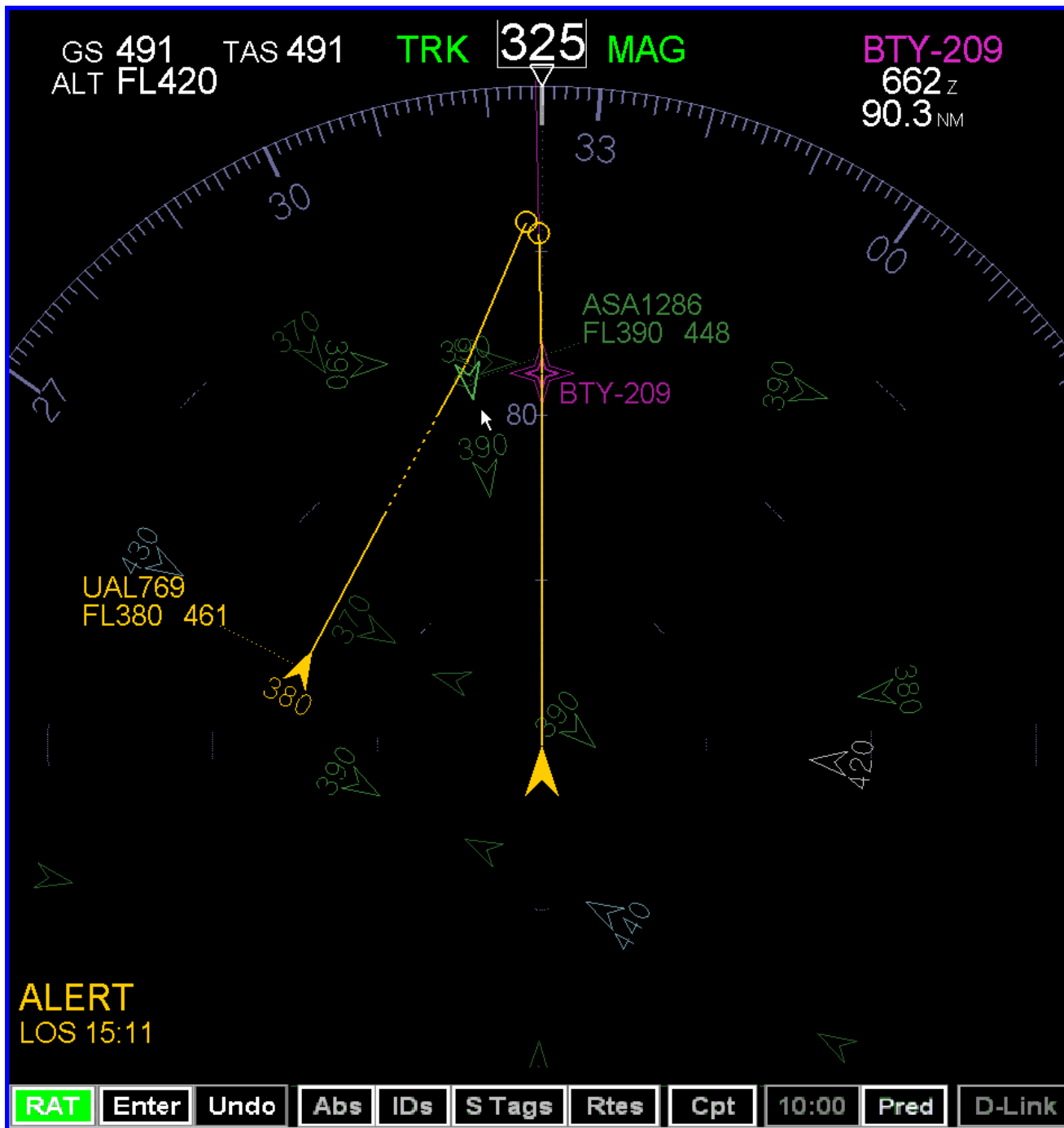


GS 491
ALT FL420

TAS 491

TRK 325 MAG

BTY-209
662_Z
90.3_{NM}

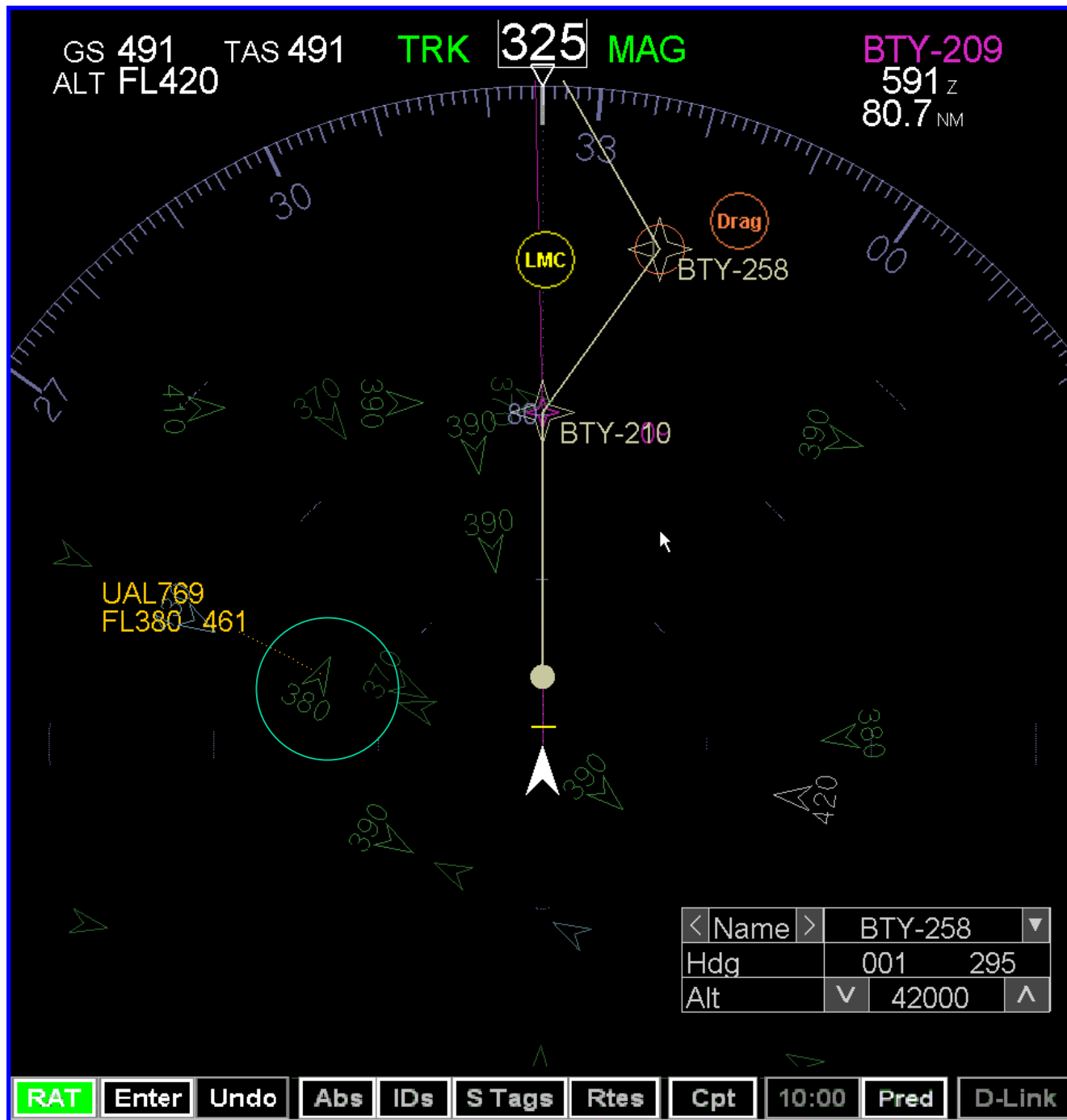


GS 491
ALT FL420

TAS 491

TRK 325 MAG

BTY-209
591 Z
80.7 NM



< Name >	BTY-258	▼
Hdg	001	295
Alt	▼ 42000	▲

RAT

Enter

Undo

Abs

IDs

S Tags

Rtes

Cpt

10:00

Pred

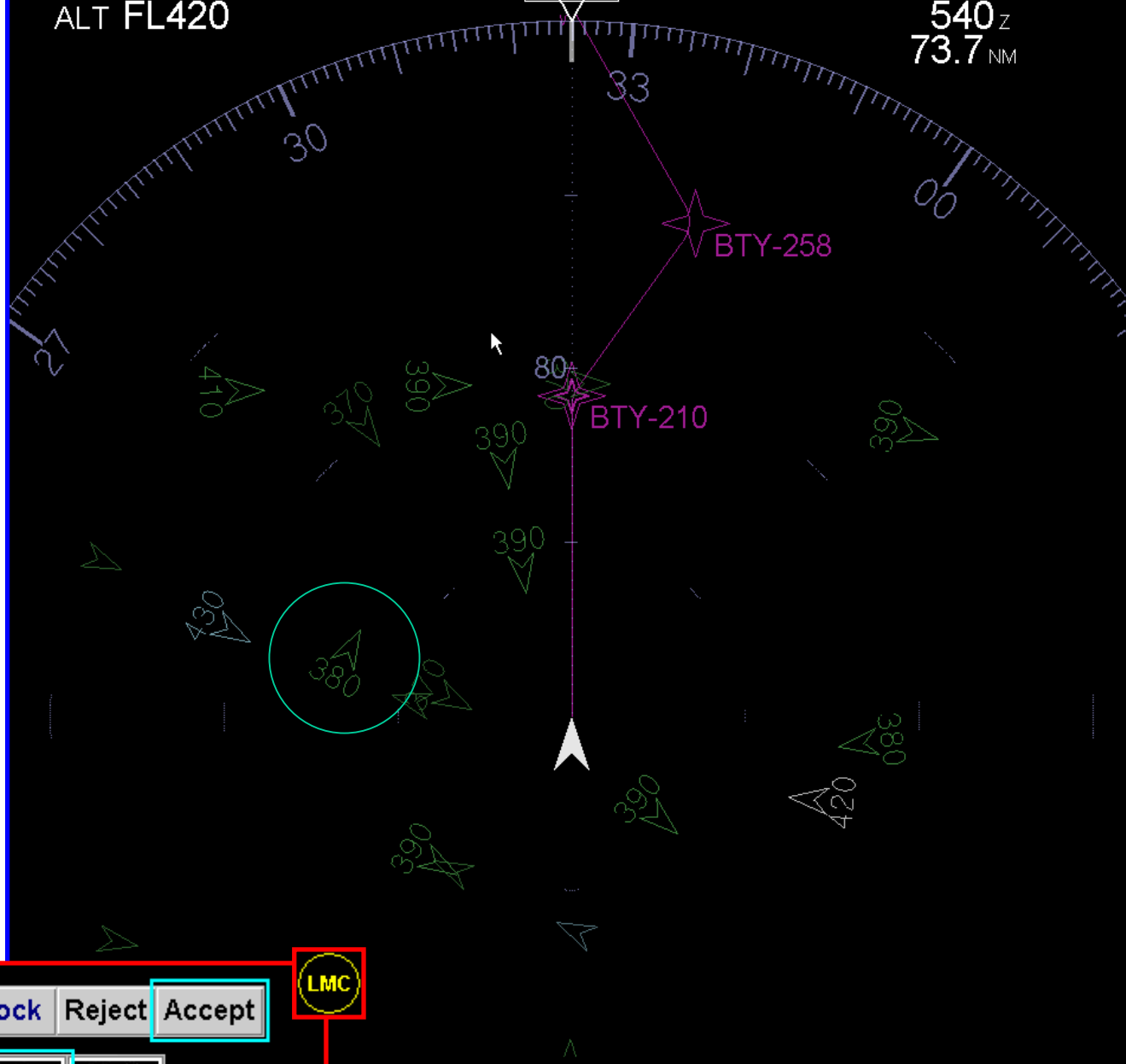
D-Link

GS 491
ALT FL420

TAS 491

TRK 325 MAG

BTY-210
540^Z
73.7_{NM}



Lock

Reject

Accept

LMC

RAT

Enter

Undo

LMC

Abs

IDs

S Tags

Rtes

Cpt






10:00

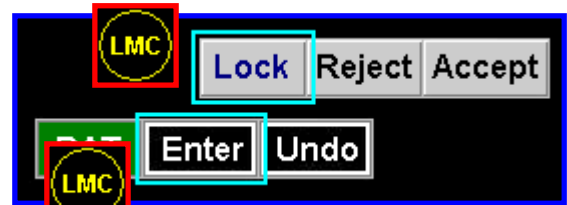
Pred

D-Link

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Advanced – Route Assessment Tool (CE-6: Free Flight Airspace)

- » Loss of Separation Alert [**LOS 10:45**]
- » Engage Route Assessment Tool - RAT 
- » Modify ownship heading (speed, altitude) 
- » “Lock,” and submit flight plan change to ATC 
- » Receive Data Link-ed ATC approval 
- » Click Accept, to execute new flight plan 

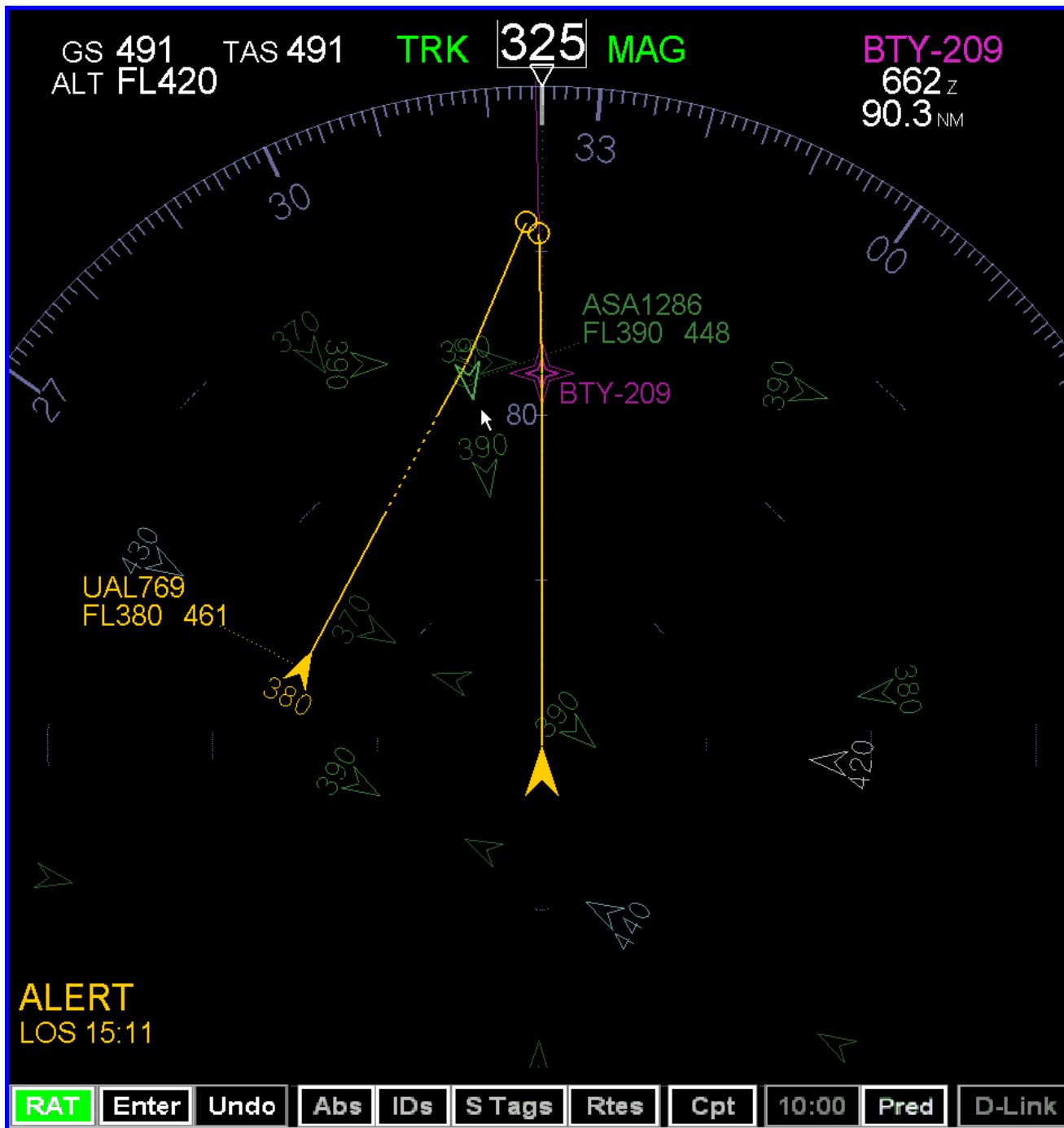


GS 491
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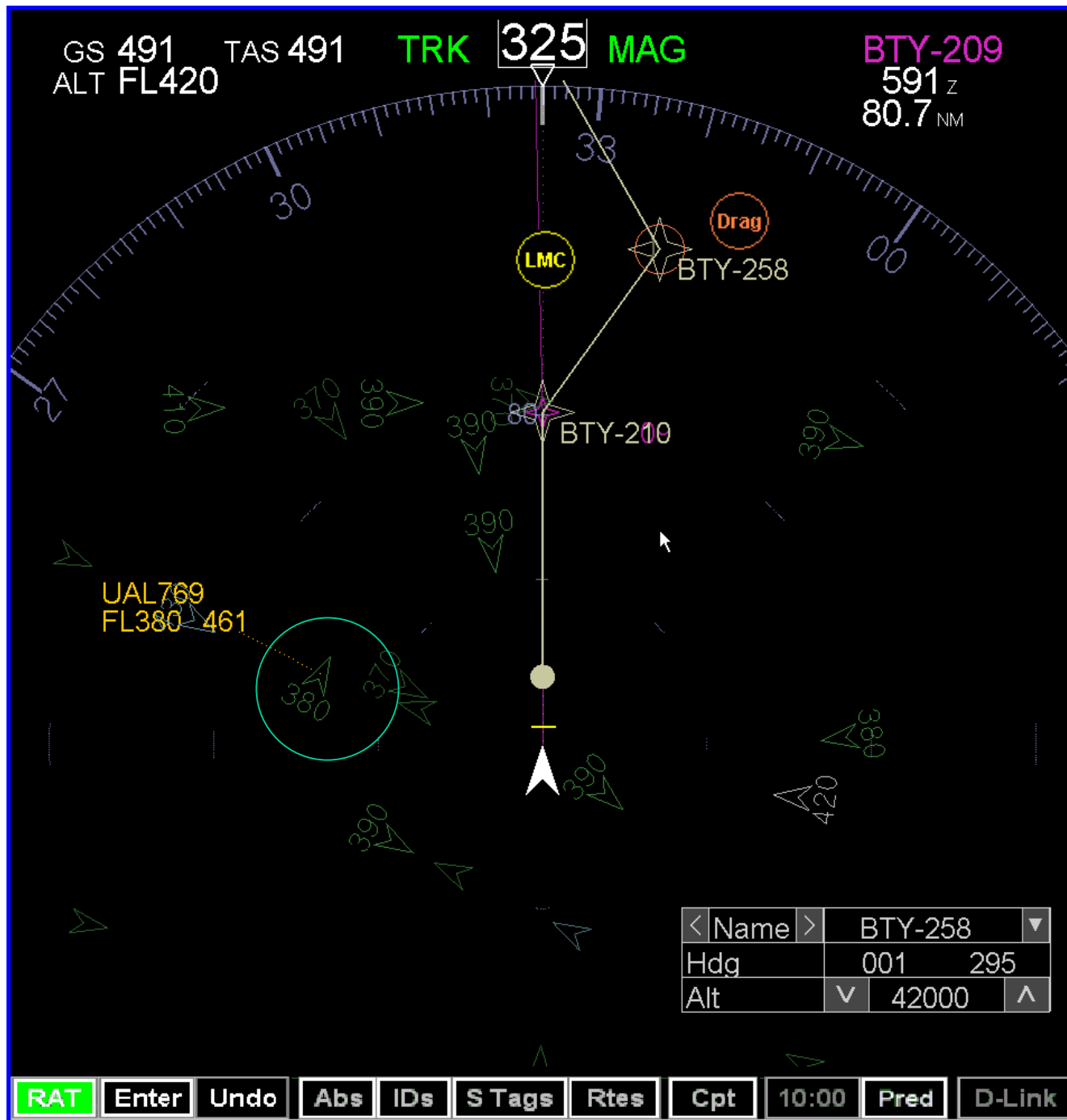


GS 491
ALT FL420

TAS 491

TRK 325 MAG

BTY-209
591 Z
80.7 NM



< Name >	BTY-258	▼
Hdg	001	295
Alt	▼ 42000	▲

RAT

Enter

Undo

Abs

IDs

S Tags

Rtes

Cpt

10:00

Pred

D-Link

GS 491
ALT FL420

TAS 491

TRK 325 MAG

BTY-210
540^Z
73.7 NM



LMC 1. Lock Reject Accept

RAT Enter Undo LMC

2. D-Link LMC

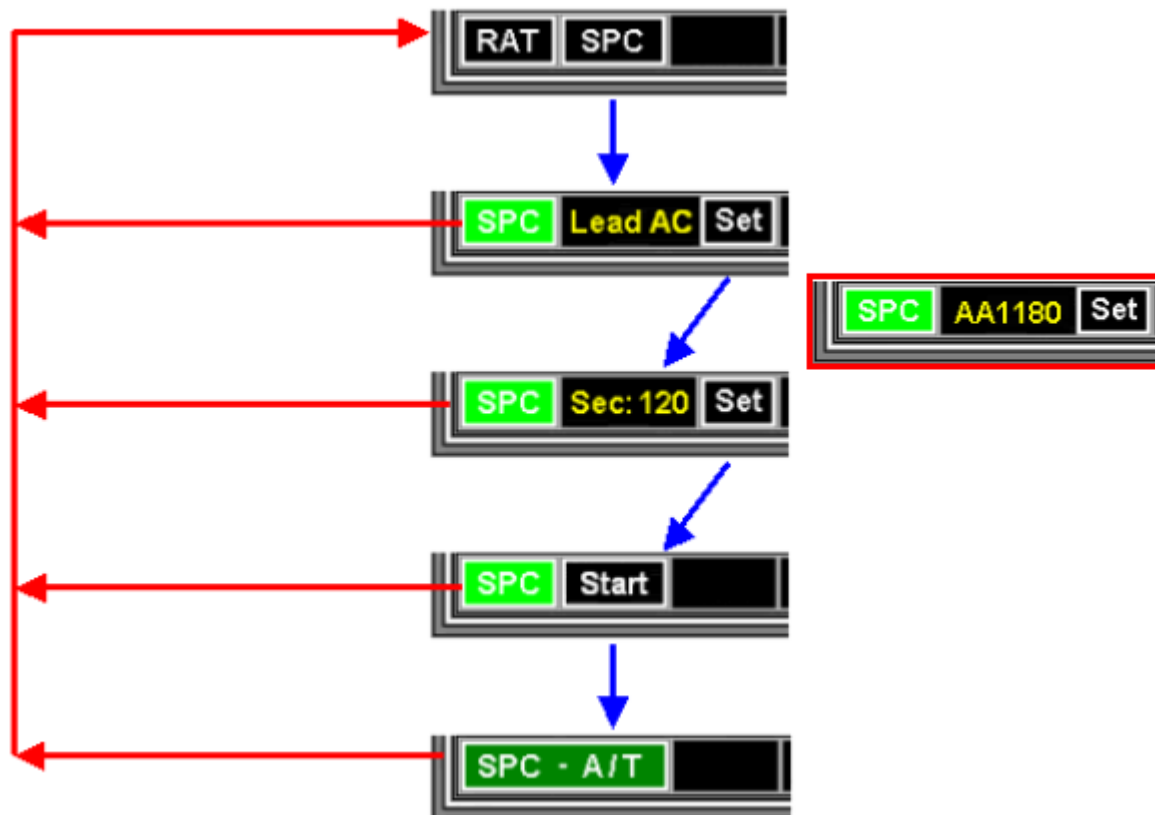
3. Lock Reject Accept

RAT Enter Undo

Abs IDs S Tags Rtes Cpt 10:00 Pred D-Link

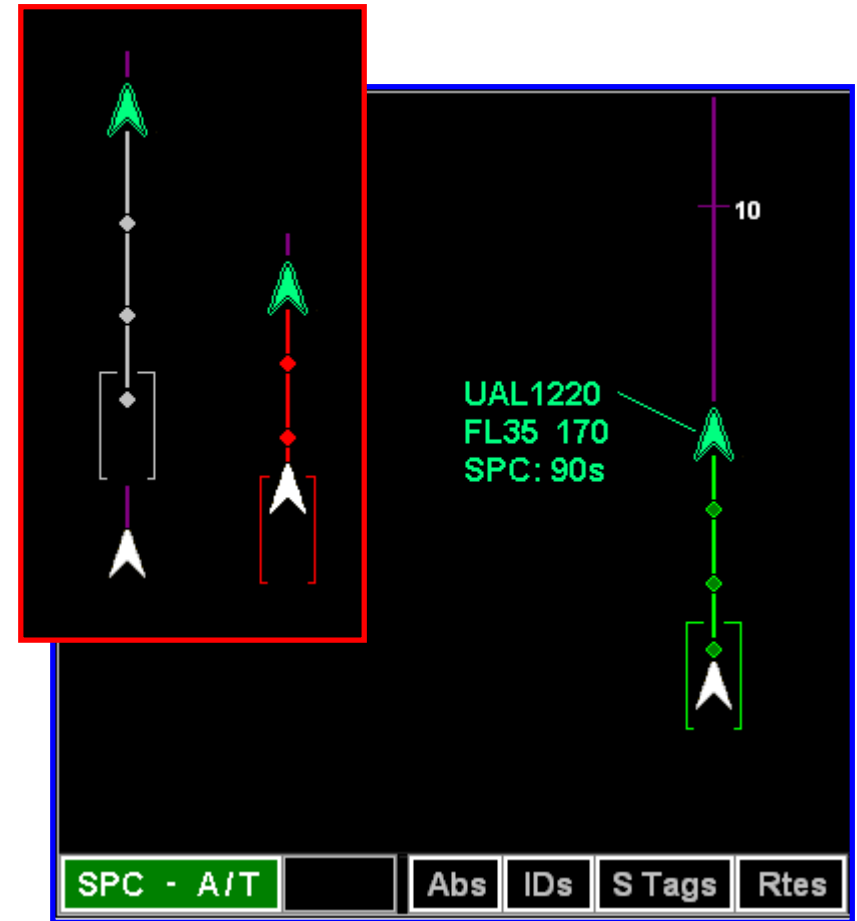
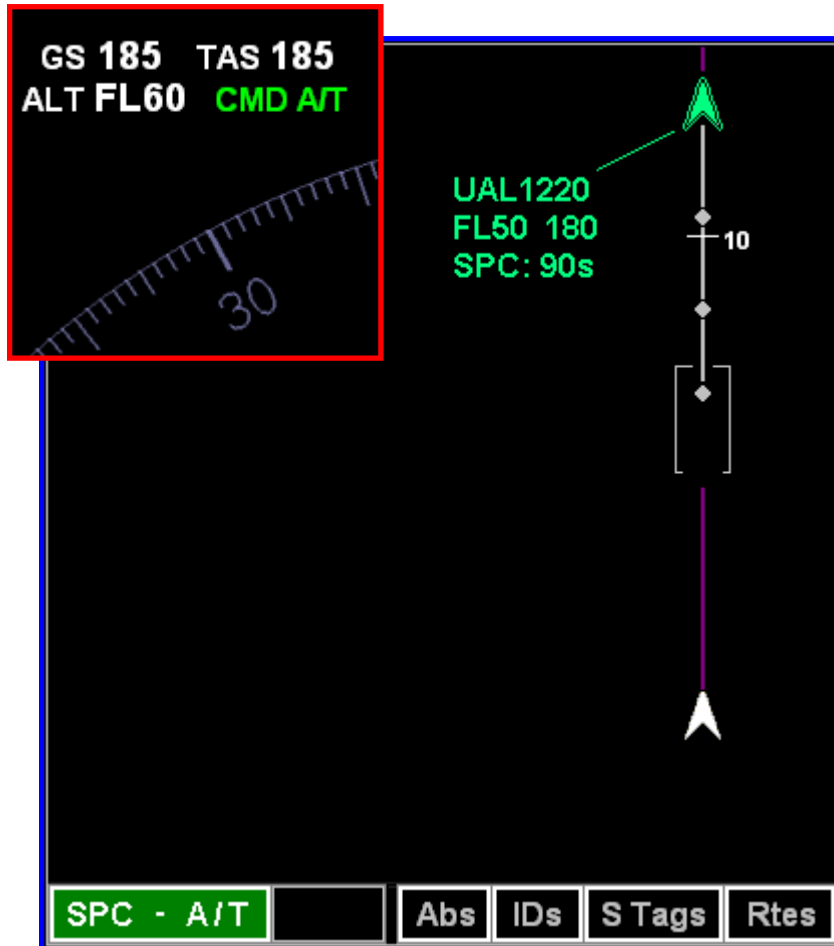
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Approach Spacing



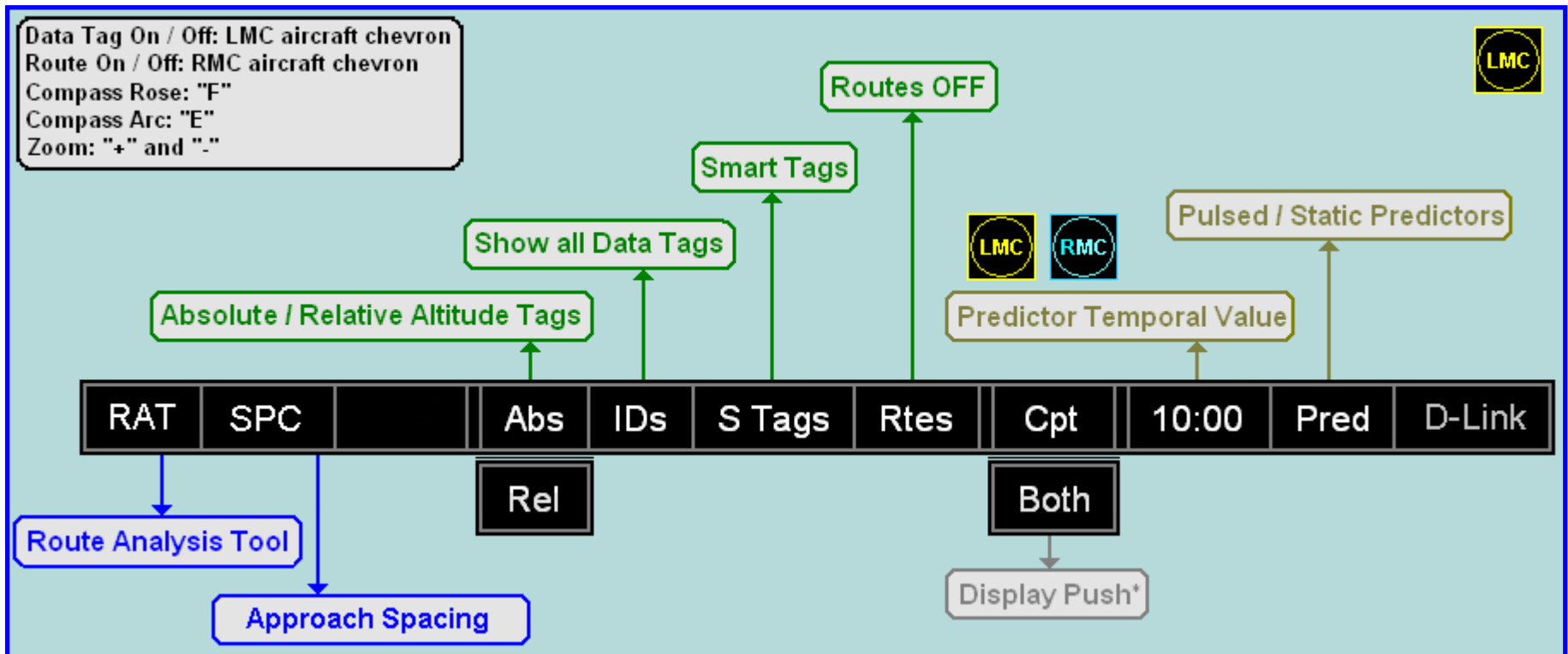
CDTI

Approach Spacing

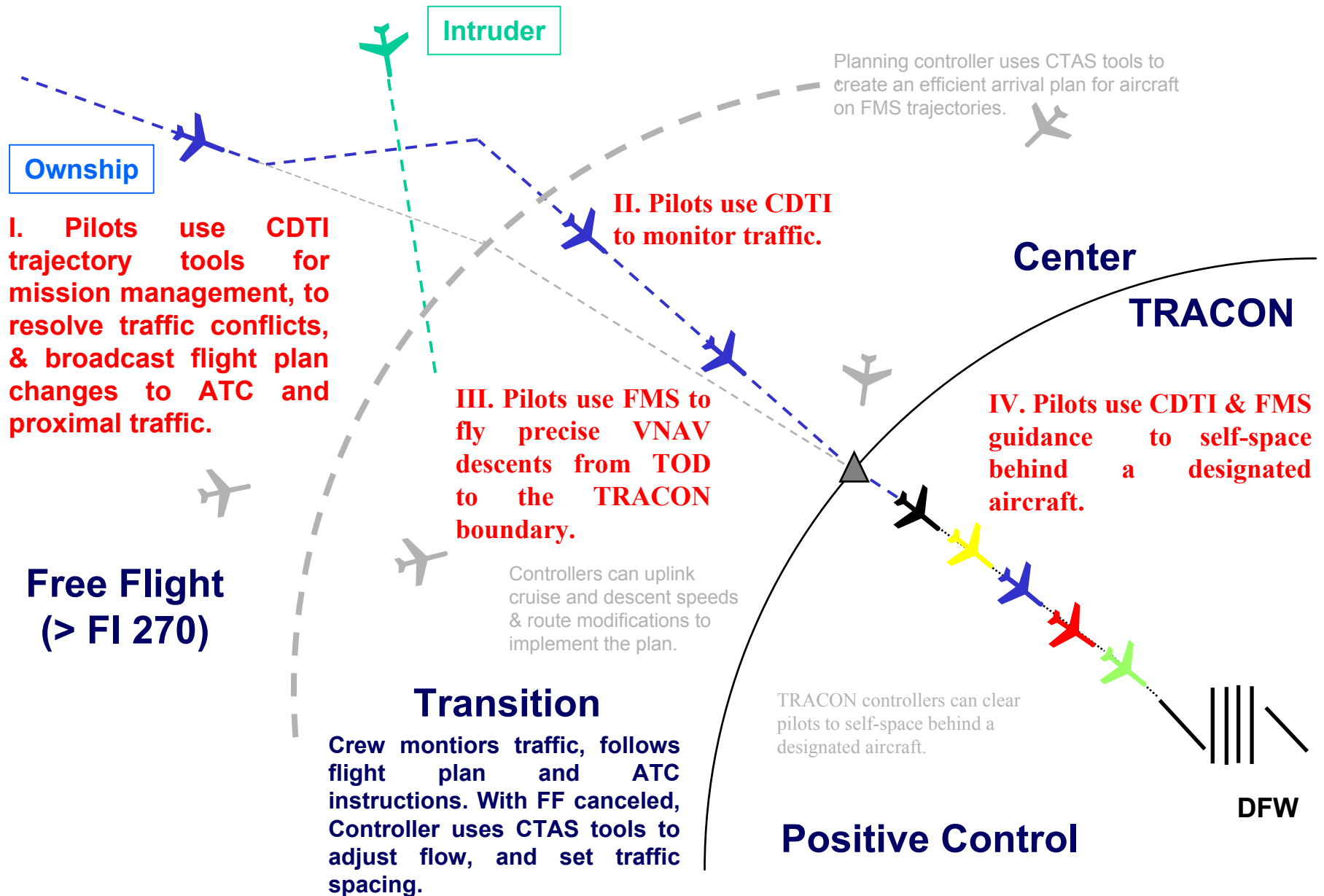


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CDTI Tool Bar



Airspace and Pilot Scenario Events



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Roles and Responsibilities

CE5 Free Flight Air Space (1) – Flight deck is responsible for flight management and separation. Using RAT, plan and implement for flight management and separation assurance. Controller is responsible for traffic management.

CE5 Transition Airspace (2) – After free flight is canceled, controller is responsible for separation and traffic management. Flight crew is responsible for conformance with current and modified clearances.

CE11 TRACON (3) – Same as 2 above, except controller will assign lead aircraft and spacing interval, and flight crew will comply using “SPC” tool.

CDTI

Roles and Responsibilities

CE6 Free Flight Air Space (1) – Controller is responsible for traffic management and separation assurance. Flight deck *may* use RAT to plan and submit flight plan changes to ATC for approval.

CE6 Transition Airspace (2) – Controller is responsible for separation and traffic management. Flight crew is responsible for conformance with current and modified clearances.

CE11 TRACON (3) – Same as 2 above, except controller will assign lead aircraft and spacing interval, and flight crew will comply using “SPC” tool.